

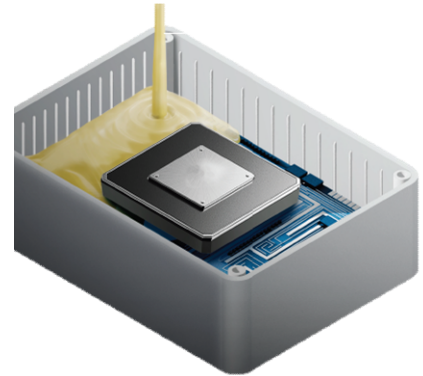
# 3CTY Thermal Solution

## TYPO SERIES

TYPO series can solve the problem of temperature. It is in liquid form and is also called 'Thermal Encapsulants'. It can protect components from shock and vibration as well as thermal management.

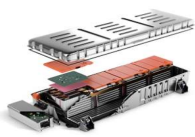
### Features

- Excellent insulation performance : Breakdown voltage 15 kV/mm <
- Excellent flowability : can fills the empty space well
- Excellent self-leveling : can be easily smeared into parts
- Low hardness : can protect the product from shock or vibration
- Excellent flame retardant performance : meet UL94 V-0 level
- High applicability : stable performance under -40 ~ 200 °C
- Satisfies RoHS and REACH standards



### Recommended applications

- Application to Electric automobile parts (Inverter, LED Backlight, EPCU, Battery Pack etc.)
- Electronic devices ( Smart phone's AP chips, Notebook's MPU, PC's CPU, Display etc.)



Battery Module / Pack



IC Substrate

### Standard products

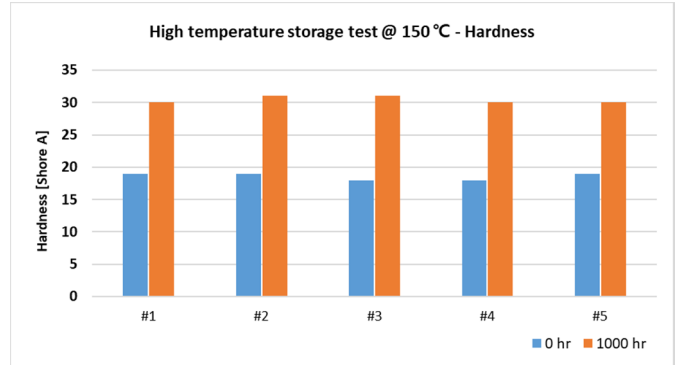
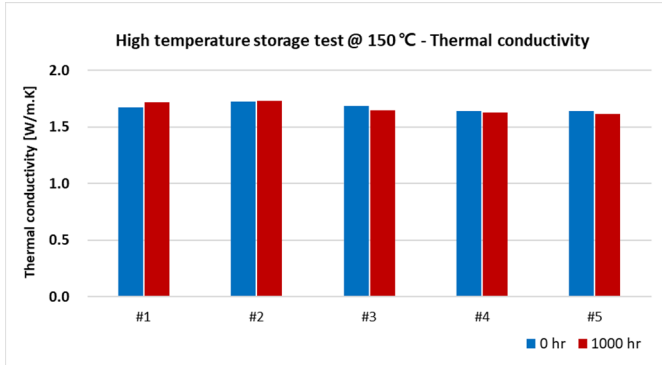
TYPO Series	Test method	TYPO-12	TYPO-16	TYPO-20
<b>Property</b>				
Appearance / Color - Part A	-	Yellow	Yellow	Yellow
Appearance / Color - Part B	-	White	White	White
Viscosity [cP] - Part A	ASTM D2196	18,000	36,000	68,000
Viscosity [cP] - Part B	ASTM D2196	16,000	28,000	42,000
Mixed Ratio	-	1 : 1	1 : 1	1 : 1
<b>Property As Curing</b>				
Curing condition	20 min @ 100°C, 2 days @ 25 °C			
Appearance / Color	-	Yellow	Yellow	Yellow
Density [g/cm <sup>3</sup> ]	ASTM D792	2.5	2.6	2.7
Thermal Conductivity [W/m·K]	ASTM D5470	1.2	1.6	2.0
Hardness [Shore A]	ASTM D2240	15	20	30
Viscosity [cP]	ASTM D2196	17,000	30,000	52,000
Breakdown Voltage [kV/mm]	ASTM D149	> 15	> 15	> 15
Volume Resistivity [Ω · cm]	ASTM D257	10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>12</sup>
Flammability	UL-94	V-0	V-0	V-0

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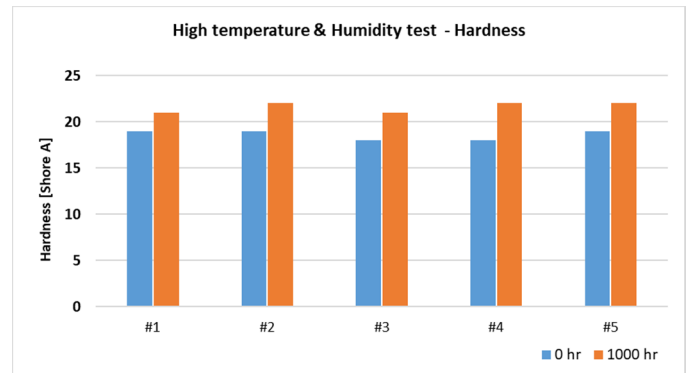
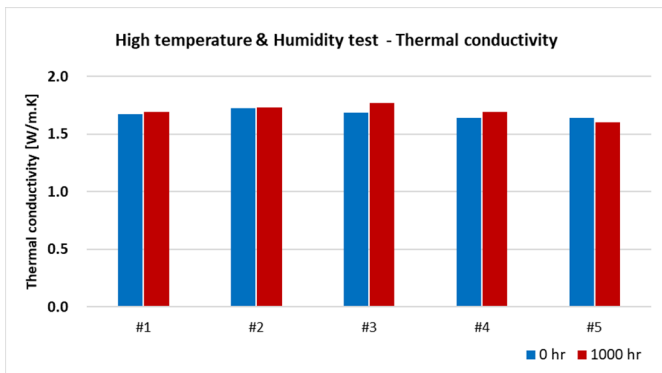
## Performance Data

### Reliability test

- High Temperature storage test (150 °C 1000hr)



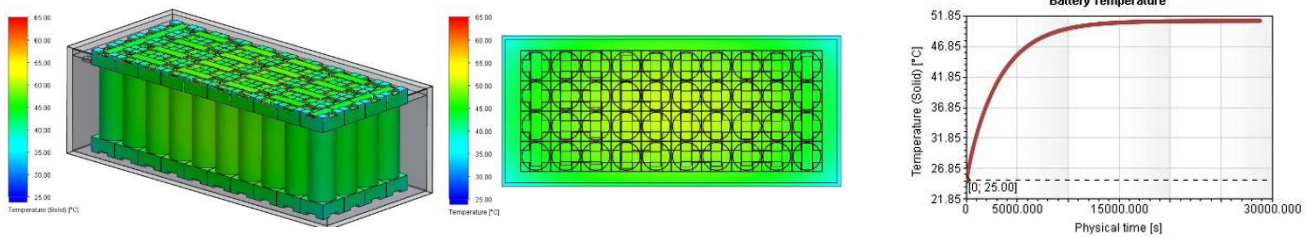
- High Temperature & Humidity test (85 °C / 85 RH% 1000 hr)



< TYPO – 16 series test results >

### Simulation Results – Applied to the Battery Pack

#### TYPO-20 Applied Results



#### TYPO-20 Unapplied Results

